

Selección del Antibiotico en UCI

Rutina Diaria

Rodolfo Soto Lieman
Cirugía General
Epidemiología Clínica

Medicina Critica y Cuidados Intensivos

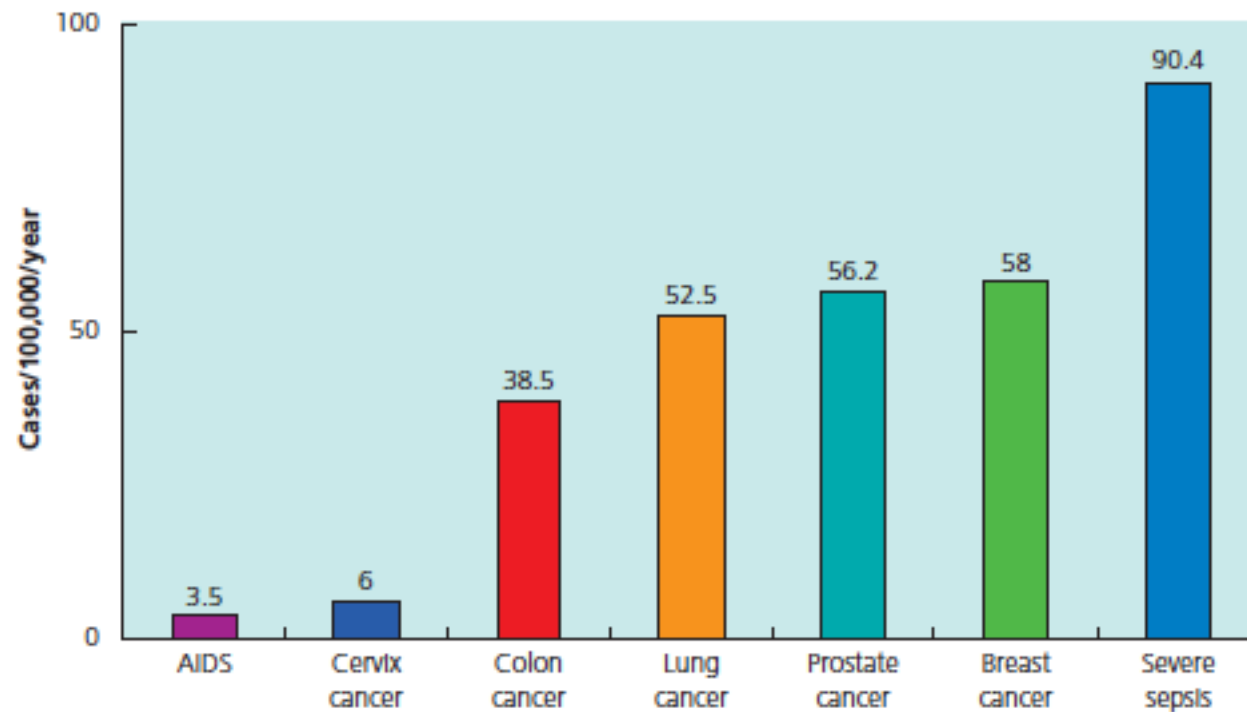


Figure 1.1 Incidence of severe sepsis in Europe. From Davies A. OECD health data 2001. *Intensive Care Medicine* 2001; **27** (suppl): 581.

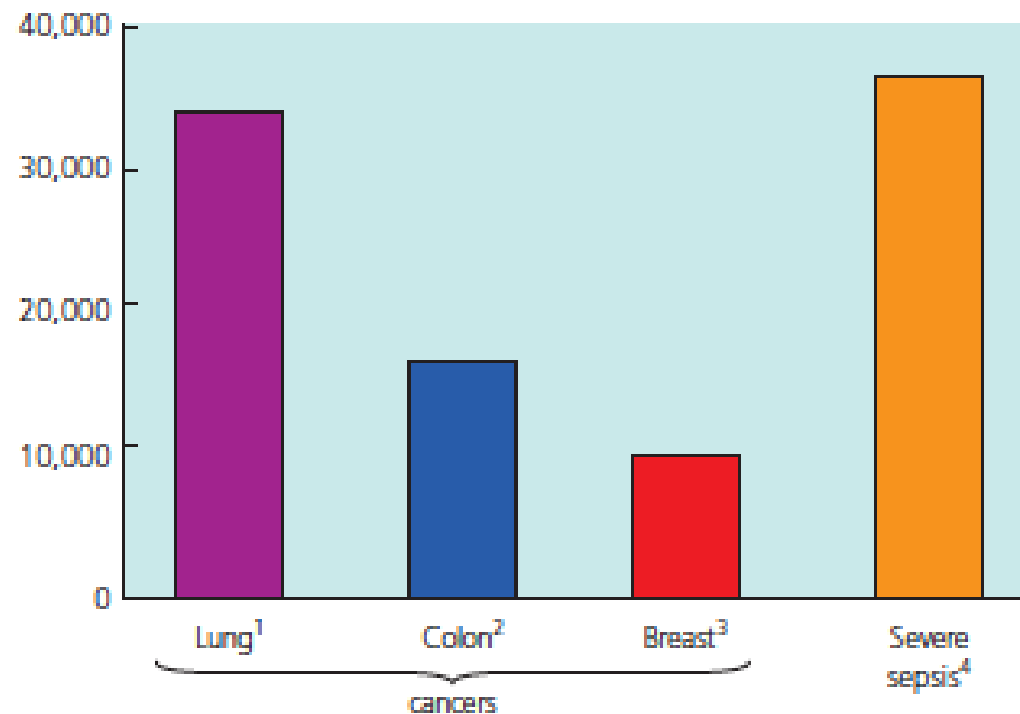


Figure 1.2 Annual mortality from the three biggest cancer killers compared with severe sepsis in the United Kingdom. (1,2,3) Lung, colon, breast cancer data from www.statistics.gov.uk; (4) sepsis data from Intensive Care National Audit Research Centre (2005).

REVIEW

Clin Microbiol Infect 2008; 14 (Suppl. 3): 15–21

Appropriate vs. inappropriate antimicrobial therapy

P. G. Davey and C. Marwick

Health Informatics Centre, Division of Community Health Sciences, Dundee, UK

Initiation of Inappropriate Antimicrobial Therapy Results in a Fivefold Reduction of Survival in Human Septic Shock

Anand Kumar, Paul Ellis, Yaseen Arabi, Dan Roberts, Bruce Light, Joseph E. Parrillo, Peter Dodek, Gordon Wood, Aseem Kumar, David Simon, Cheryl Peters, Muhammad Ahsan, Dan Chateau and the Cooperative Antimicrobial Therapy of Septic Shock Database Research Group

Chest 2009;136;1237-1248; Prepublished online August 20, 2009;
DOI 10.1378/chest.09-0087

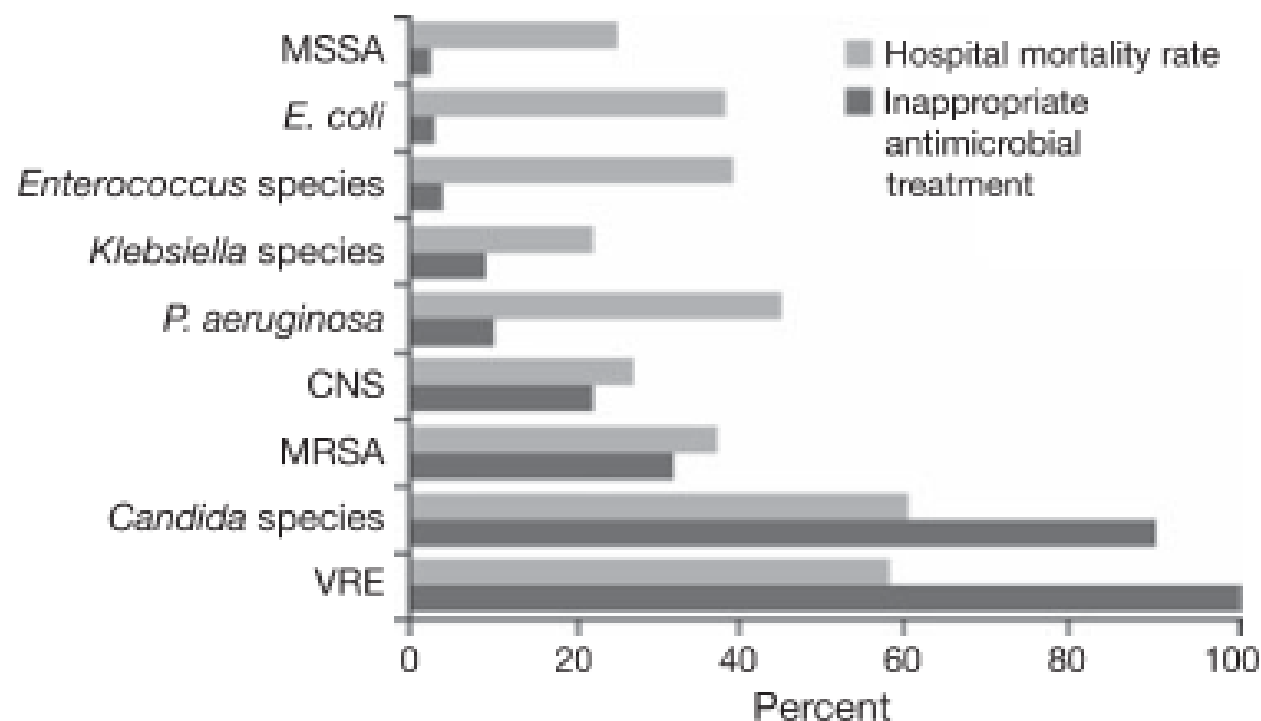


Fig. 1. Inappropriate antimicrobial treatment and mortality rates with common bloodstream infection pathogens.

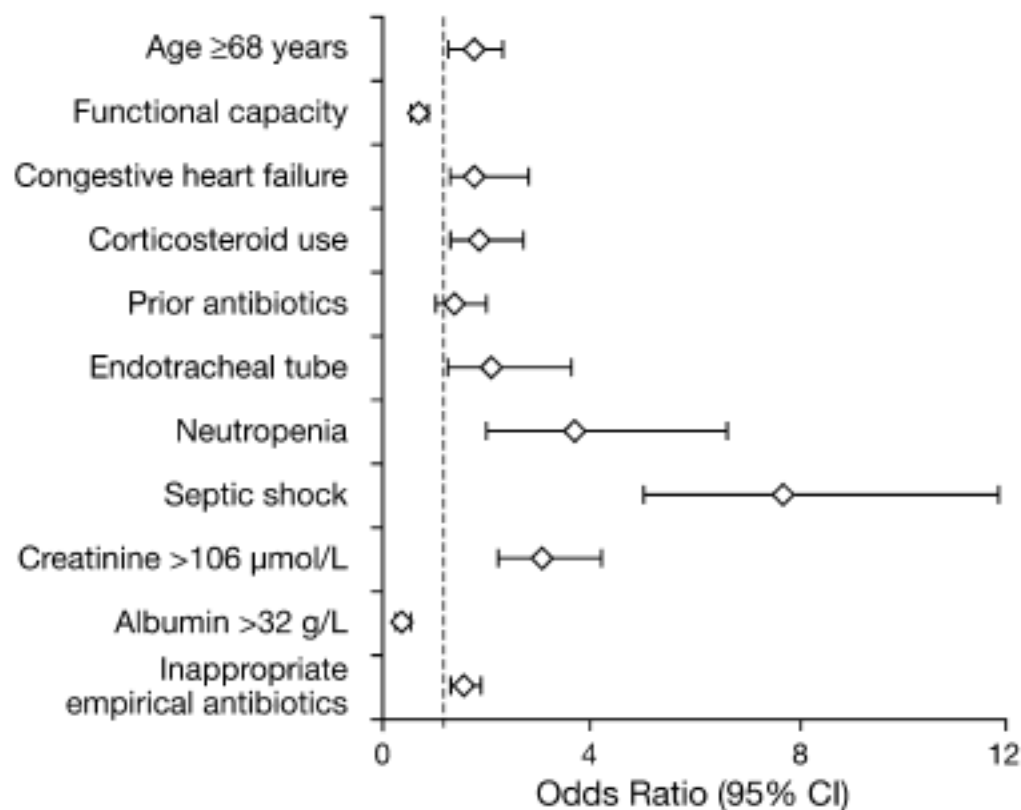


Fig. 3. Odds ratio of fatality related to inappropriate empirical treatment and other demographic, physiological and microbiological risk-factors [5].

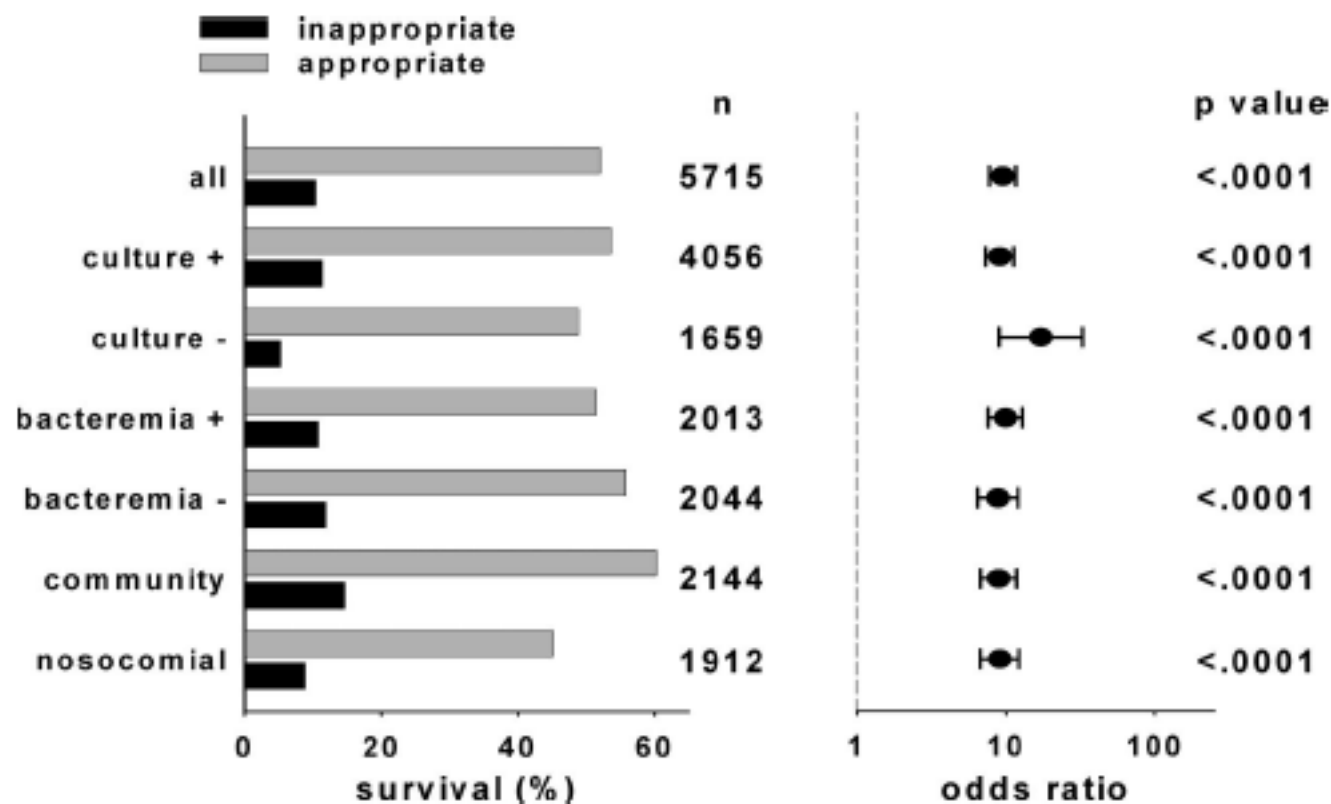


FIGURE 2. Impact of antimicrobial appropriateness on survival in major epidemiologic subgroups. See the legend of Figure 1 for abbreviations not used in the text.

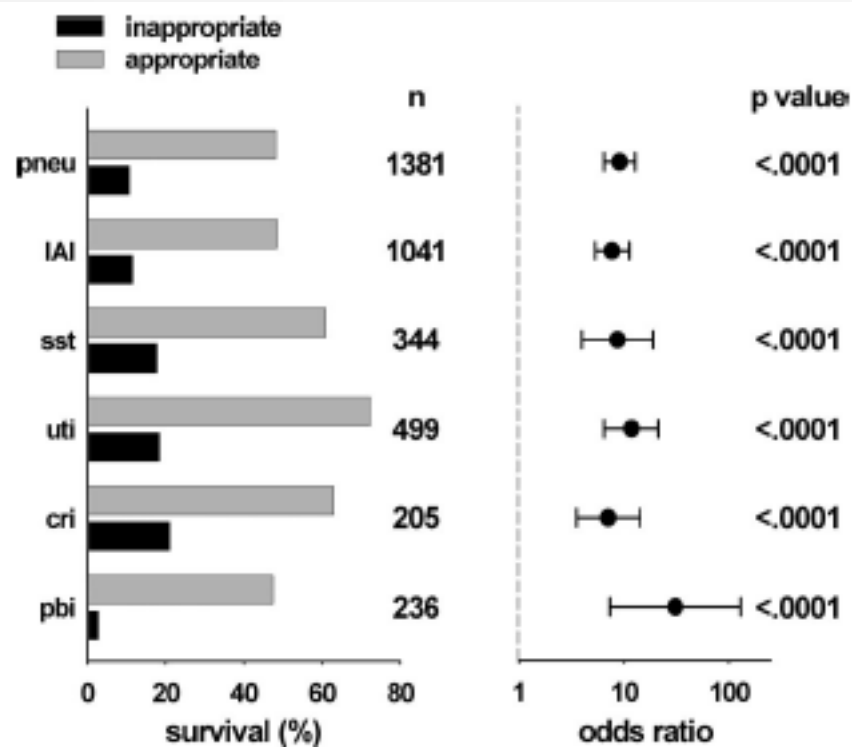


FIGURE 3. Impact of antimicrobial appropriateness on survival in clinical infection subgroups. See the legend of Figure 1 for abbreviations not used in the text.

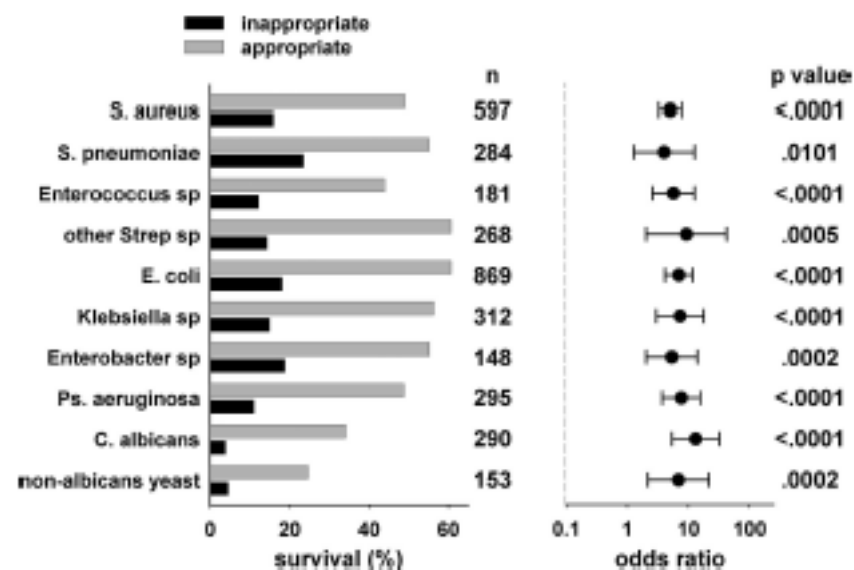
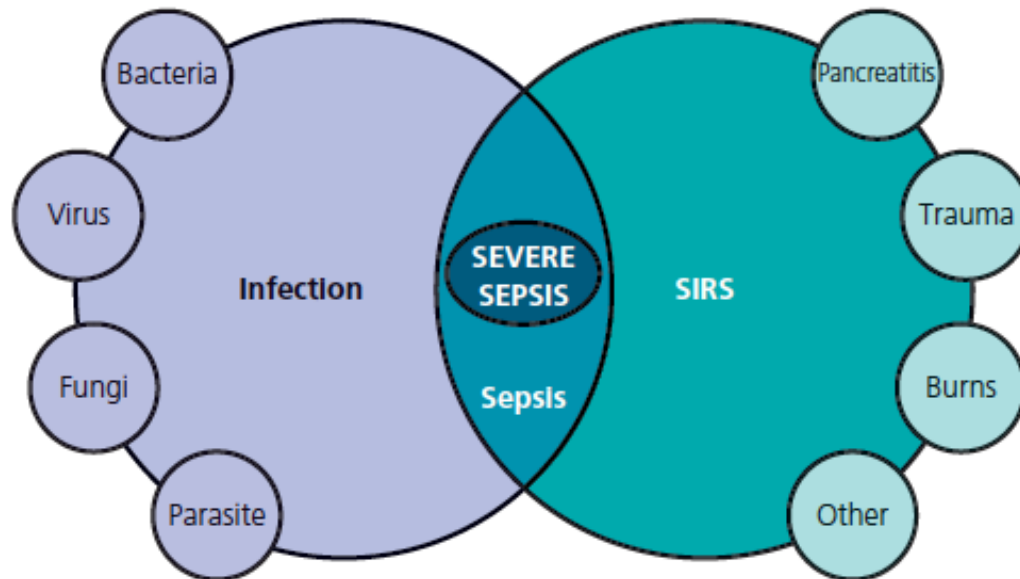
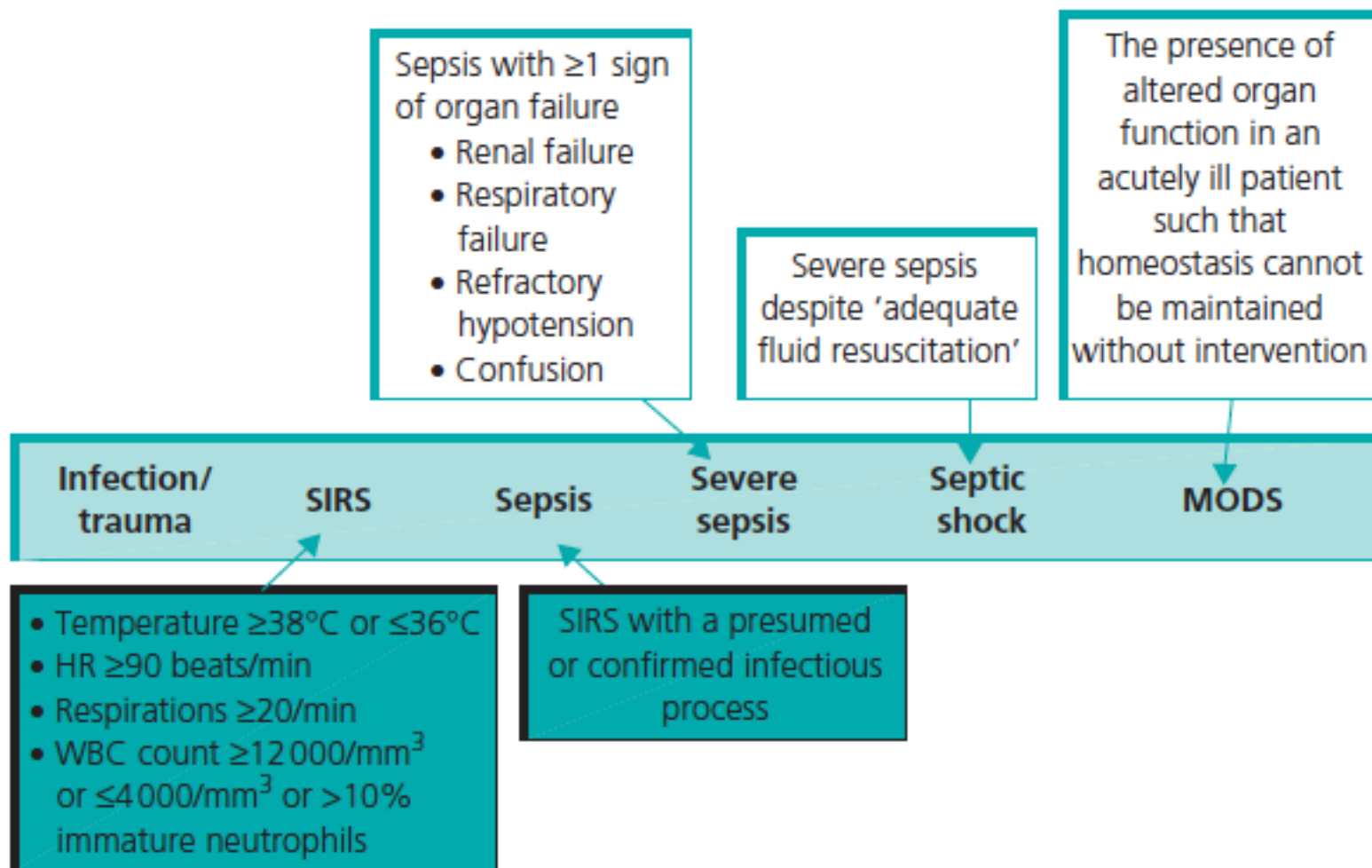


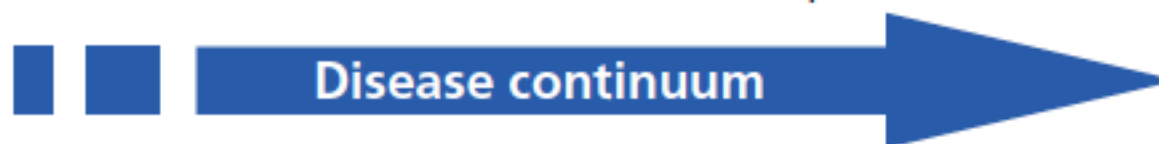
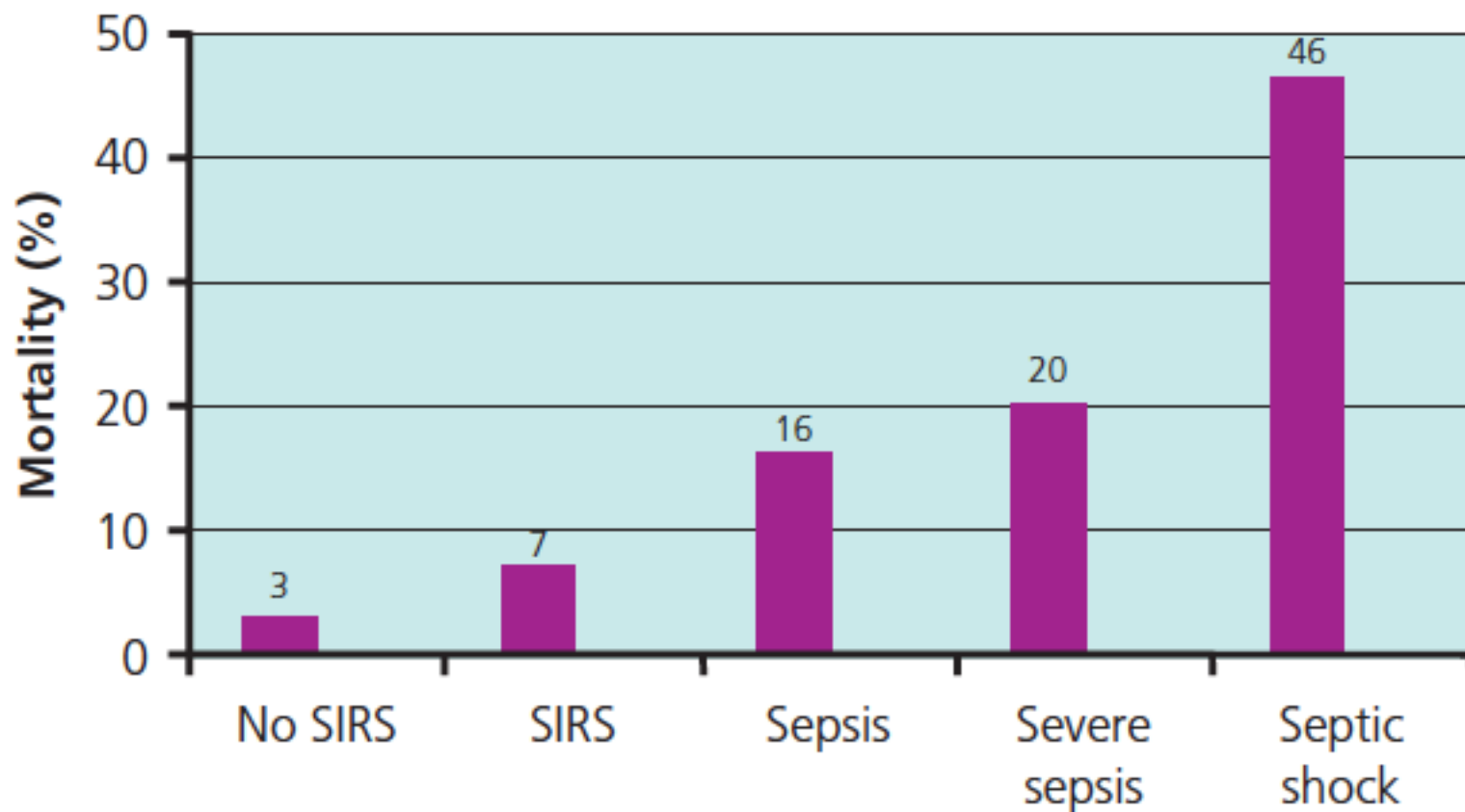
FIGURE 5. Impact of antimicrobial appropriateness on survival in specific organisms. See the legend of Figure 1 for abbreviation not used in the text.

PRIMER PASO

Identificar el Paciente con Sepsis







RESEARCH

Open Access

Insufficient β -lactam concentrations in the early phase of severe sepsis and septic shock

Fabio Silvio Taccone¹, Pierre-François Laterre², Thierry Dugernier³, Herbert Spapen⁴, Isabelle Delattre⁵, Xavier Witebolle², Daniel De Backer¹, Brice Layeux⁶, Pierre Wallemacq⁵, Jean-Louis Vincent¹ and Frédérique Jacobs^{*6}

Conclusions: Serum concentrations of the antibiotic after the first dose were acceptable only for meropenem. Standard dosage regimens for piperacillin-tazobactam, ceftazidime and cefepime may, therefore, be insufficient to empirically cover less susceptible pathogens in the early phase of severe sepsis and septic shock.

SURGICAL INFECTIONS
Volume 11, Number 2, 2010
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DOI: 10.1089/sur.2009.007

Bacteremia Increases the Risk of Death among Patients with Soft-Tissue Infections

Scott T. Micek,¹ Alex P. Hoban,¹ Victor Pham,² Joshua A. Doherty,² Marya D. Zilberberg,³
Andrew F. Shorr,⁴ and Marin H. Kollef⁵

SEGUNDO PASO

Identificar el Foco Infeccioso

Historia clinica

Examen Fisico

Gram y cultivos

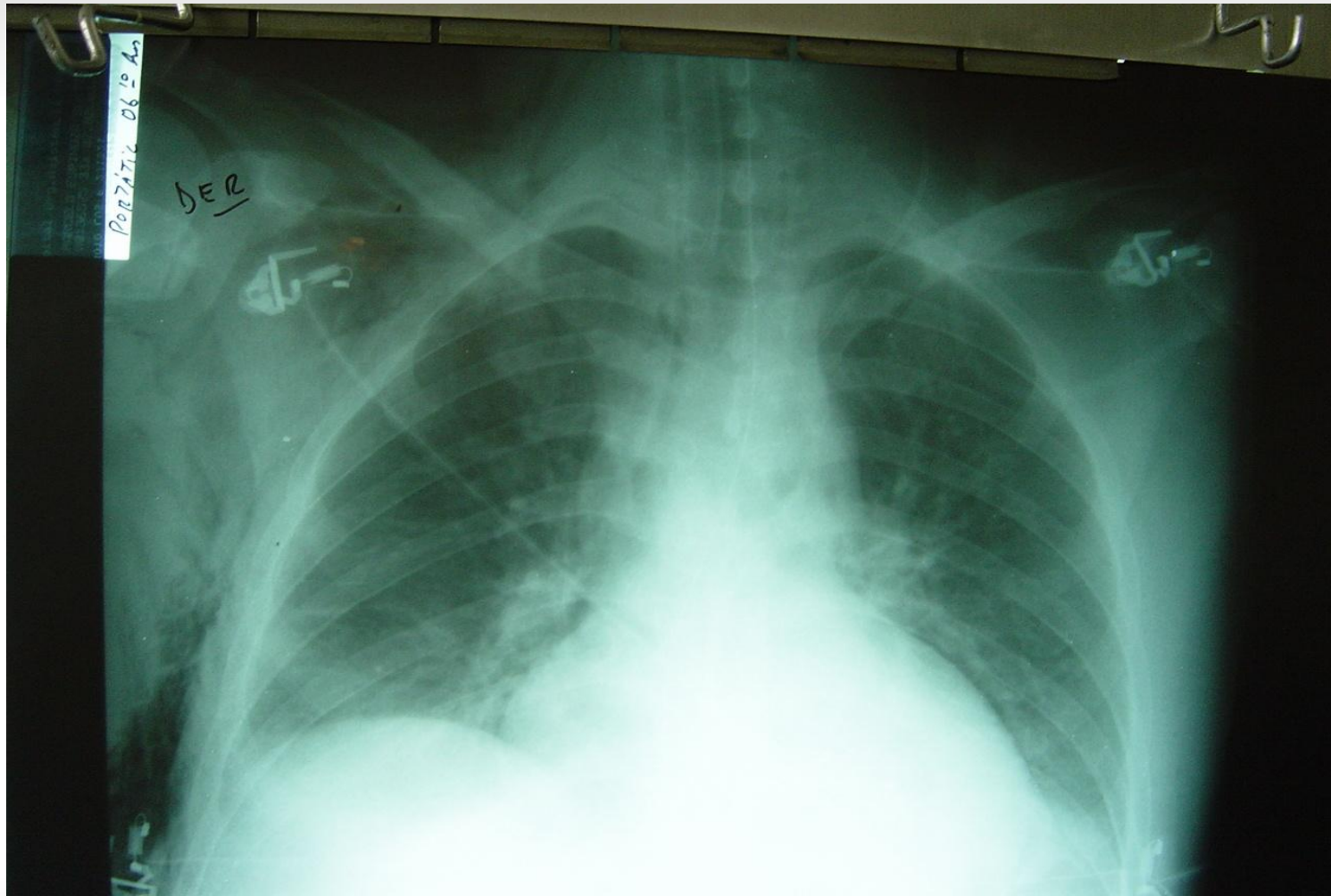
Imagenes

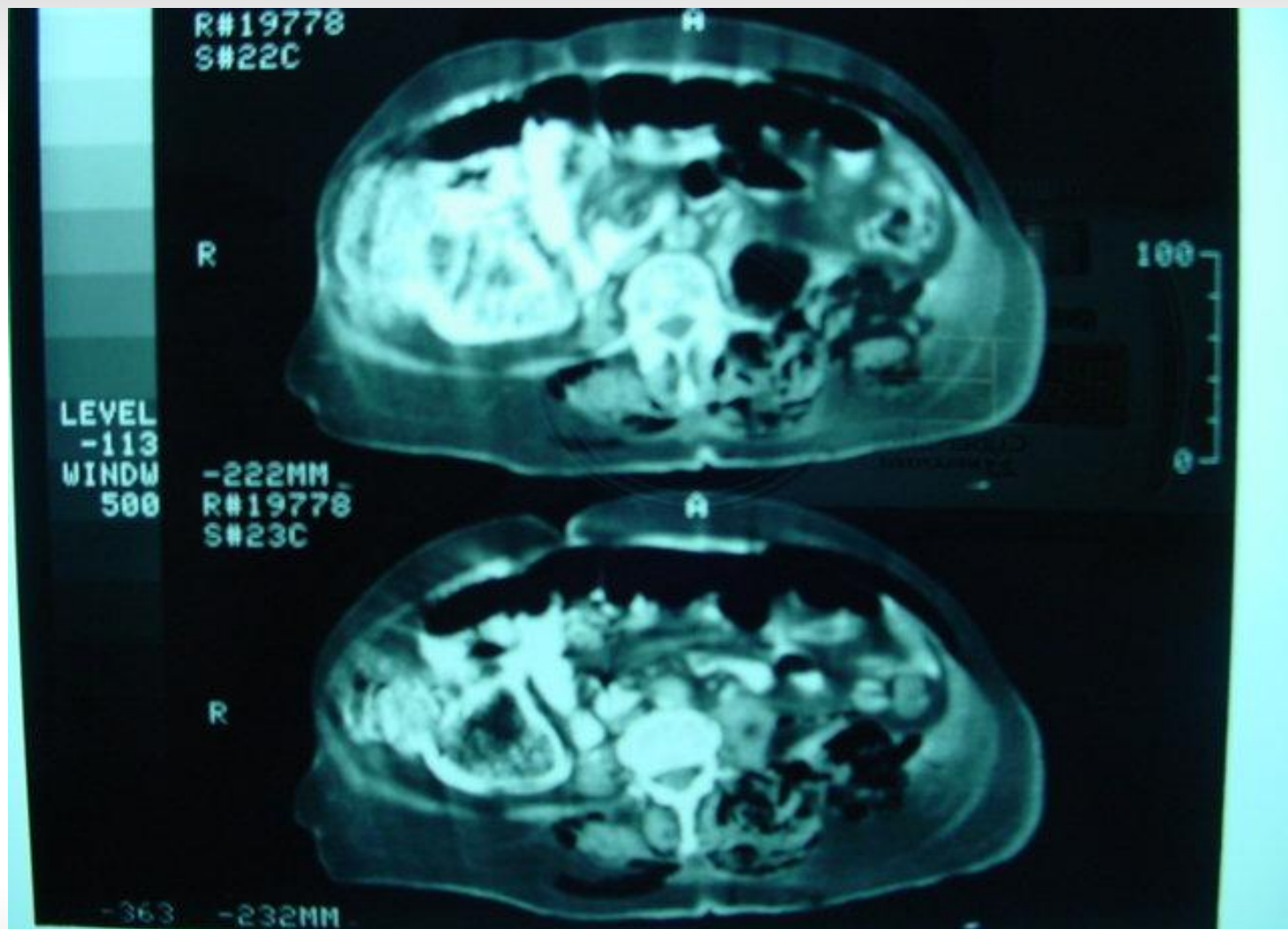










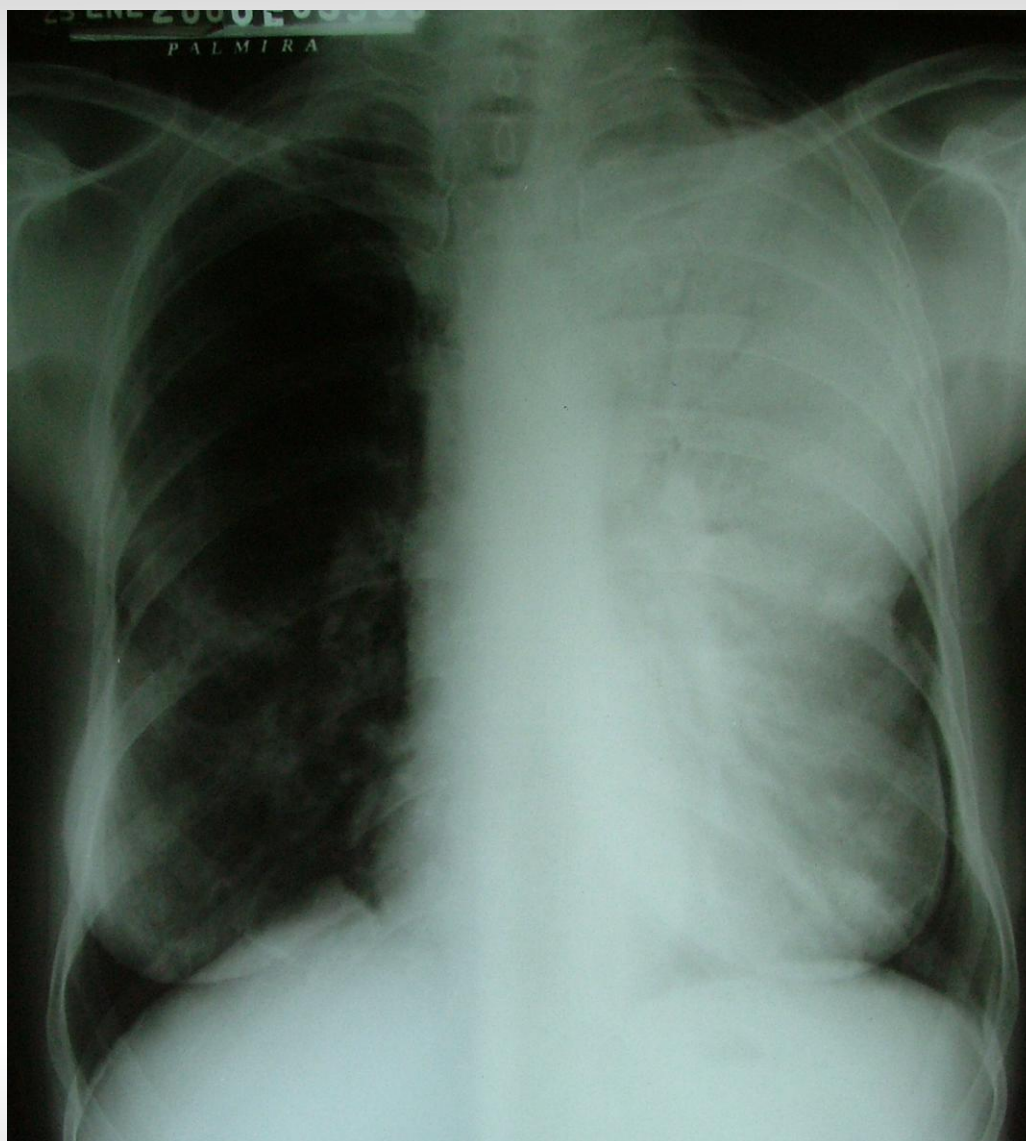


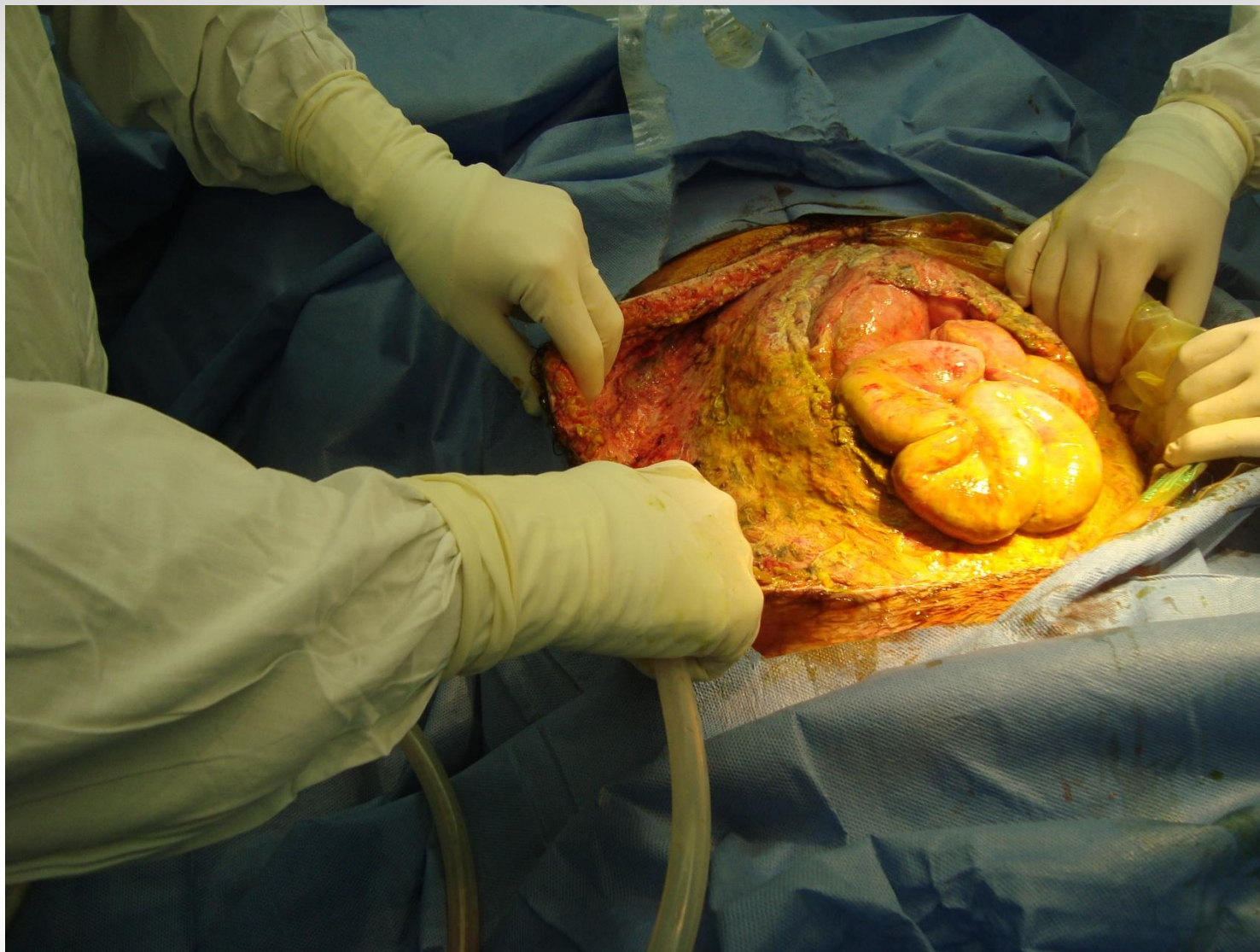


TERCER PASO

Definir el origen de la infección:

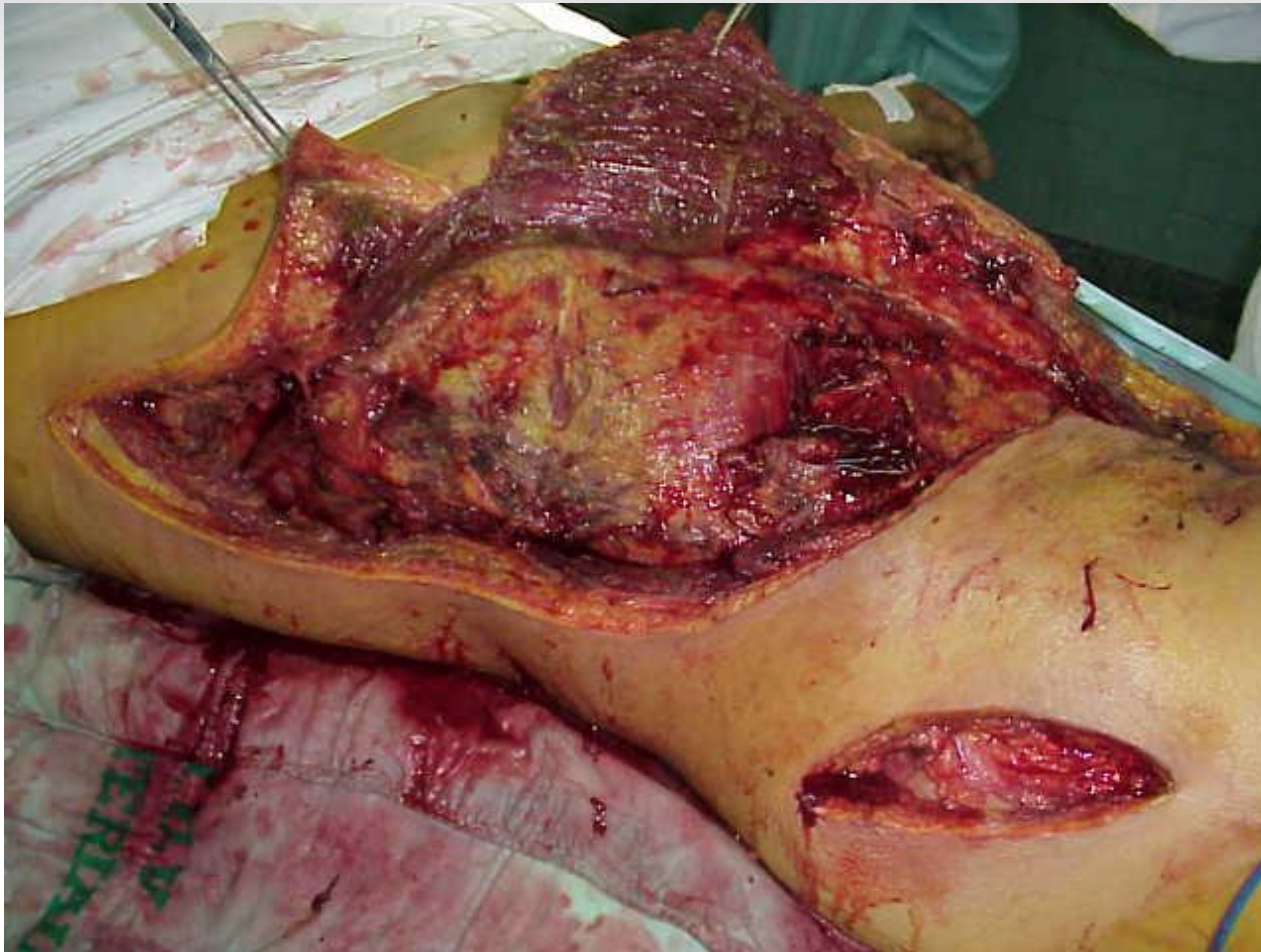
- Comunidad
- Asociada al cuidado de la salud





CUARTO PASO

***Cuáles son los germenés más
frecuentes de acuerdo al foco y al
origen de la infección?***



CUARTO PASO

INFECCIONES DE PIEL Y TEJIDOS BLANDOS

- Aerobios y anaerobios
- Enterococo (8%)
- S. pyogenes
- S. aureus (40%)
- E. Coli
- Bacteroides

QUINTO PASO

***Defina al paciente en cuanto a factores
de riesgo para germen
multiresistentes.***

QUINTO PASO

Condiciones sistémicas

- Abuso de antibióticos
- Inmunosupresión, uso de esteroides
- Edad
- Enfermedades metabólicas crónicas
- Diabetes
- Malnutrición
- Infecciones mal tratadas

QUINTO PASO

Cuáles son los factores de riesgo para que el estafilococo aureus adquirido en la comunidad sea meticilino resistente?

Salgado CD, Farr BM, Calfee DP. Community-Acquired
Methicillin-Resistant *Staphylococcus aureus*:
A meta-analysis of prevalence and risk factors.
Clin Infect Dis. 2003;36:131-139

- Hospitalización reciente
- Home care
- Tratamientos antibióticos previos
- Enfermedades crónicas
 - IRC terminal
 - Diabetes mellitus
 - Malignidad
- Drogadictos
- Contacto con personas con algún factor de riesgo

Salgado CD, Farr BM, Calfee DP. Community-Acquired Methicillin-Resistant Staphylococcus aureus: A meta-analysis of prevalence and risk factors.
Clin Infect Dis. 2003;36:131-139

- 4121 pacientes
- 17 estudios retrospectivos
- 86.1% $\geq$ 1 factor de riesgo**
 - Hospitalización reciente
 - Enfermedad crónica

- 515 pacientes
- 7 estudios prospectivos
- 84.7% $\geq$ 1 factor de riesgo**

Am J Infect Control. 2004;32:436-40

Prediction rules to identify patients with methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant enterococci upon hospital admission

Jon P. Furuno, MS,^a Anthony D. Harris, MD, MPH,^{a,b} Marc-Oliver Wright, MS, MT (ASCP),^c Jessina C. McGregor,^a Richard A. Venezia, PhD,^d Jingkun Zhu, MS,^e and Eli N. Perencevich, MD, MS^{a,b}
Baltimore, Maryland

QUINTO PASO

Cual es la probabilidad de que una infección complicada de piel y tejidos blandos sea producida por estafilococo aureus meticilino resistente?

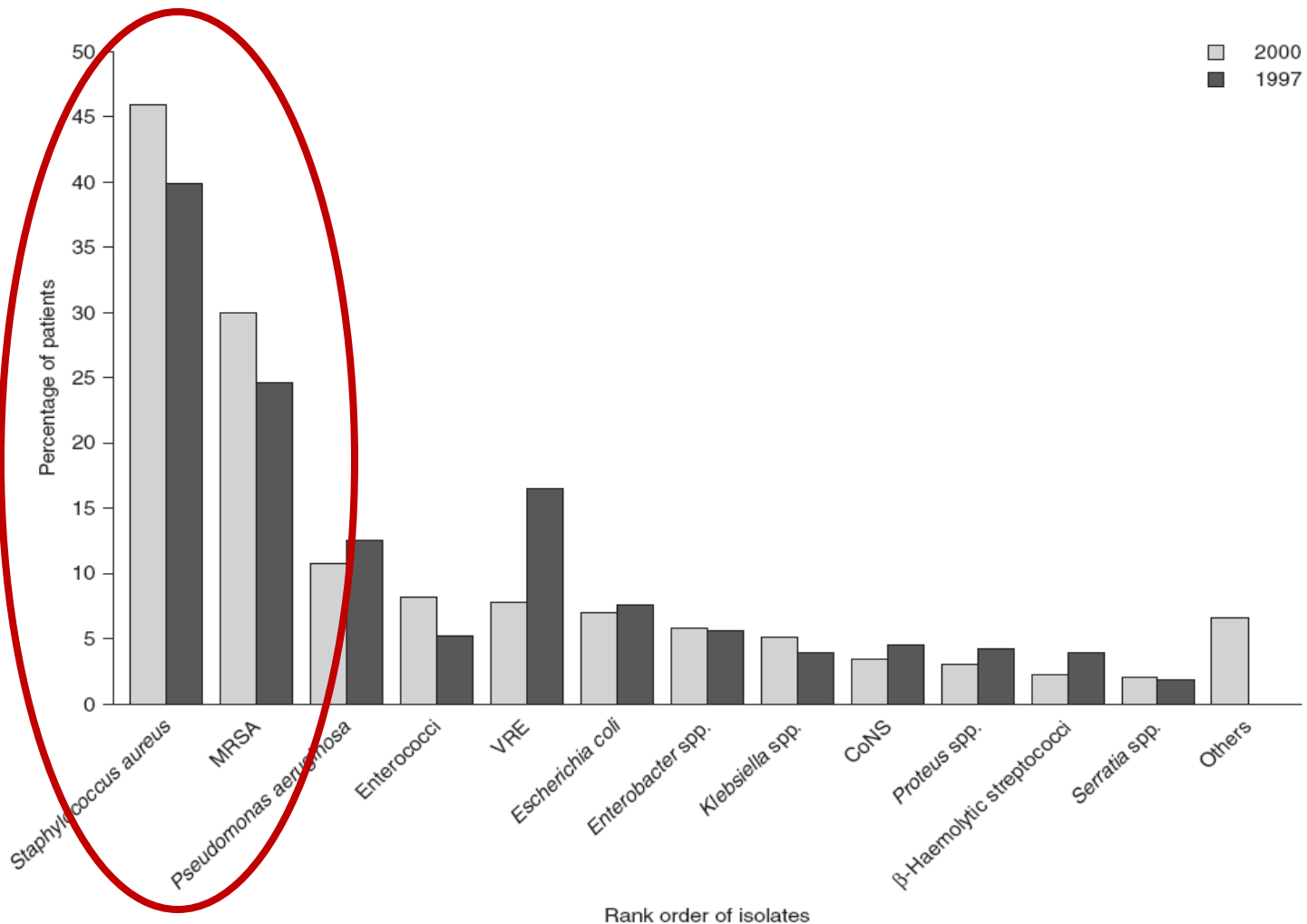
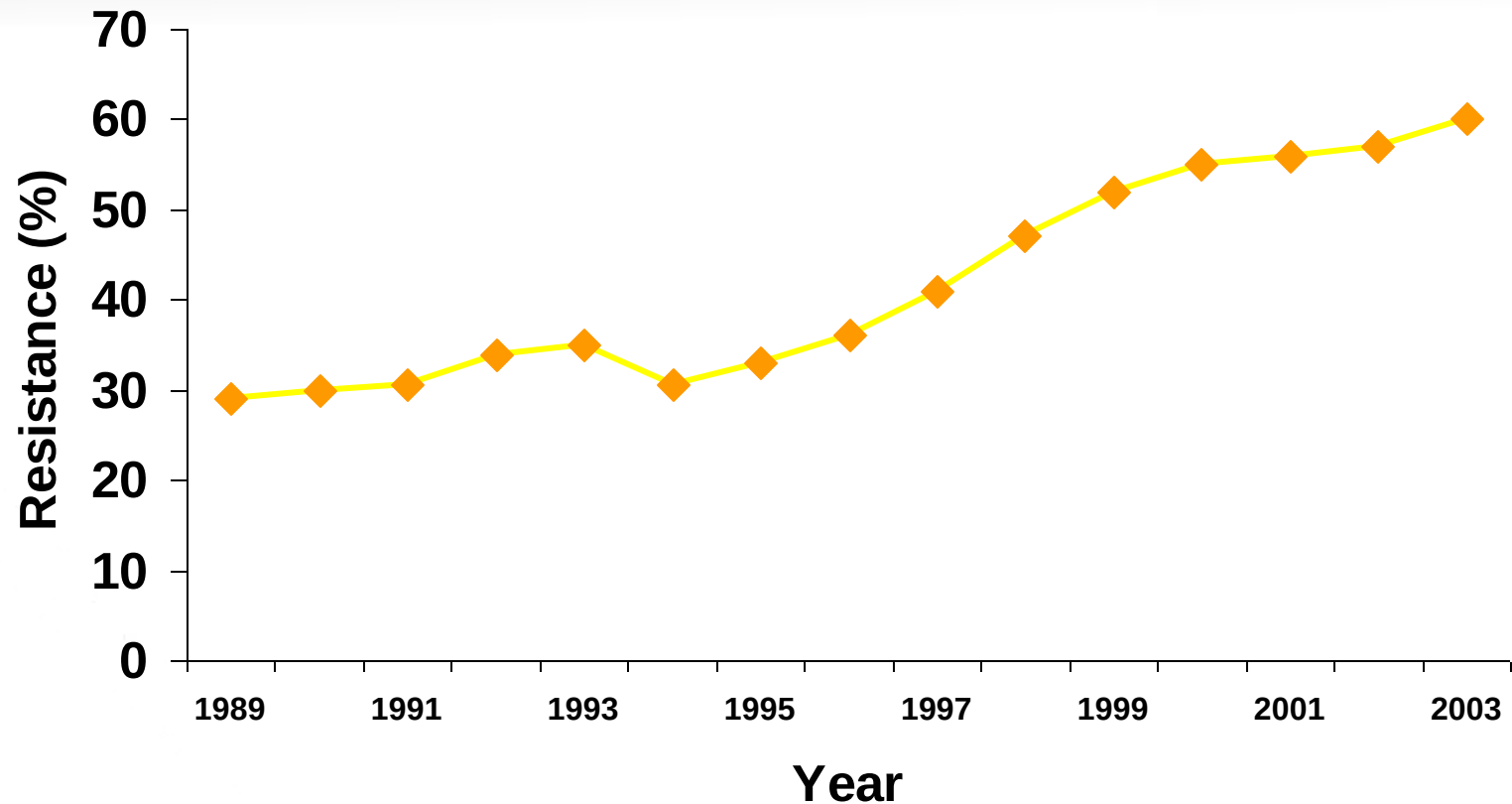


Fig. 1. Comparative frequency of pathogens isolated from skin and soft tissue infections among hospitalised patients in the SENTRY Antimicrobial Surveillance Programs in North America and Canada in the years 1997 and 2000.^[10,11] **CoNS** = coagulase-negative staphylococci; **MRSA** = methicillin-resistant *S. aureus*; **VRE** = vancomycin-resistant enterococci.

Proporción de infecciones nosocomiales causadas por *Staphylococcus aureus* resistentes a oxacilina (SARM) entre pacientes de UCIs, 1989-2003



Adaptado de CDC. Disponible en: <http://www.cdc.gov/ncidod/hip/Aresist/SARM.htm>

Multicentre surveillance of antimicrobial resistance in enterococci and staphylococci from Colombian hospitals, 2001–2002

C. A. Arias^{1,2*}, J. Reyes¹, M. Zúñiga¹, L. Cortés¹, C. Cruz¹, C. L. Rico² and D. Panesso¹
on behalf of the Colombian Antimicrobial Resistance Group (RESCOL)[†]

¹Bacterial Molecular Genetics Unit, Centro de Investigaciones, Universidad El Bosque, Transv 9a Bis No. 133-25, Bogotá; ²Surgical Microbiology Service, Department of Surgery, Fundación Santa Fé de Bogotá, Calle 116 No. 9-02, Bogotá, Colombia

- 15 hospitales de tercer nivel
- Estafilococo aureus 49.6%
 - **Resistente a oxacilina** **52%**
- Estafilococo coagulasa negativo 29.6%
 - **Resistente a oxacilina** **73%**

Salgado CD, Farr BM, Calfee DP. Community-Acquired
Methicillin-Resistant Staphylococcus aureus:
A meta-analysis of prevalence and risk factors.
Clin Infect Dis. 2003;36:131-139

- 5932 pacientes
- 27 estudios retrospectivos

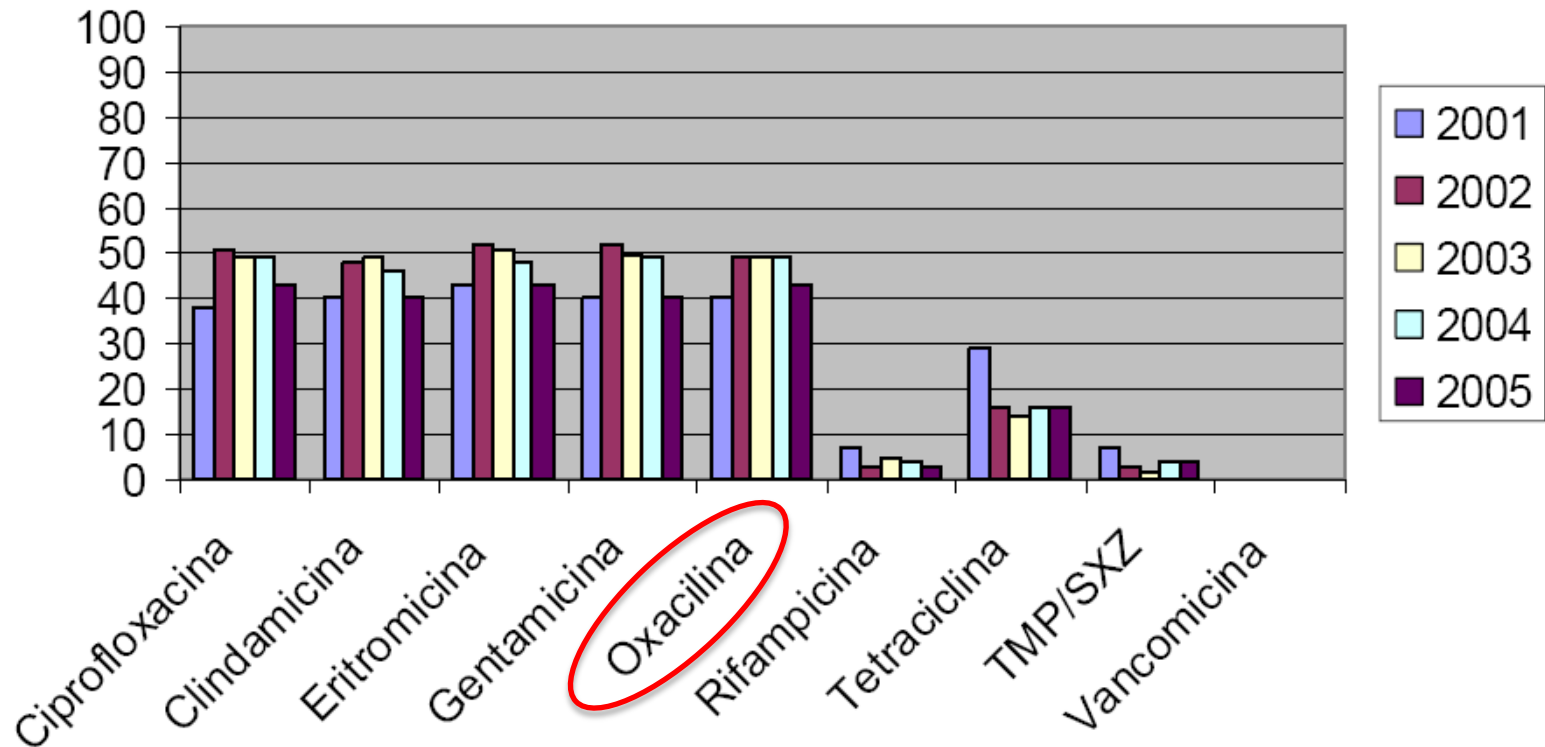
•**Prevalencia** **30.2% (1.9 – 96%)**

- 636 pacientes
- 5 estudios prospectivos

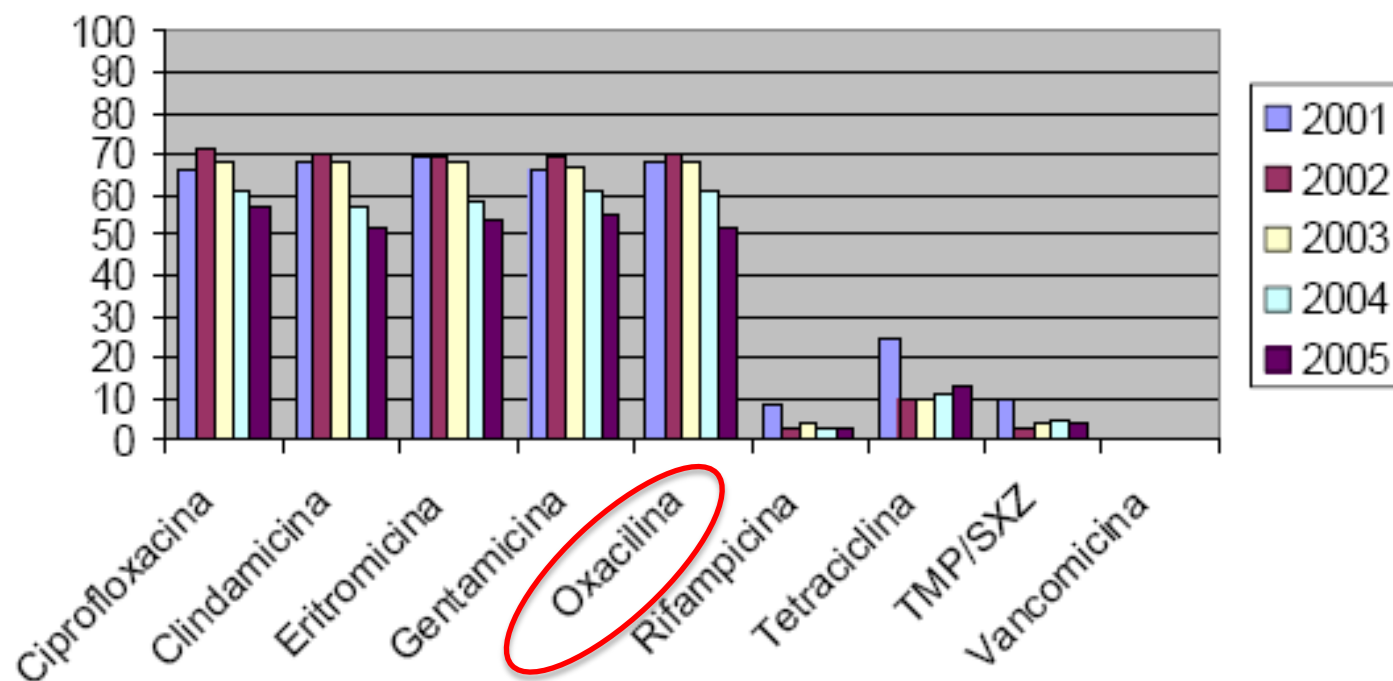
•**Prevalencia** **37.3% (18.2 – 51.2 %)**

GRÁFICOS DE PERFILES DE RESISTENCIA DE COCOS GRAM POSITIVOS GREBO 2001 – 2005

Porcentajes de resistencia de *Staphylococcus aureus* en NO UCI GREBO 2001 - 2005



Porcentajes de resistencia de *Staphylococcus aureus* en UCI GREBO 2001 - 2005



BOLETÍN No. 9 INFORME DE ACTIVIDADES AÑOS 2001 A 2005
GREBO
BOGOTÁ, D.C. – 1 DE JUNIO DE 2006

ORIGINAL ARTICLE

Necrotizing Fasciitis Caused by Community-Associated Methicillin-Resistant *Staphylococcus aureus* in Los Angeles

Loren G. Miller, M.D., M.P.H., Francoise Perdreau-Remington, Ph.D.,
Gunter Rieg, M.D., Sheherbano Mehdi, M.D., Josh Perlroth, M.D.,
Arnold S. Bayer, M.D., Angela W. Tang, M.D., Tieu O. Phung, M.D.,
and Brad Spellberg, M.D.

CONCLUSIONS

Necrotizing fasciitis caused by community-associated MRSA is an emerging clinical entity. In areas in which community-associated MRSA infection is endemic, empirical treatment of suspected necrotizing fasciitis should include antibiotics predictably active against this pathogen.

Community-Acquired Methicillin-Resistant *Staphylococcus aureus*: Prevalence and Risk Factors

Joel W. Beam; Bernadette Buckley

University of North Florida, Jacksonville, FL

Agosto 17, 2006

ORIGINAL ARTICLE

Methicillin-Resistant *S. aureus* Infections among Patients in the Emergency Department

Gregory J. Moran, M.D., Anusha Krishnadasan, Ph.D.,
Rachel J. Gorwitz, M.D., M.P.H., Gregory E. Fosheim, M.P.H.,
Linda K. McDougal, M.S., Roberta B. Carey, Ph.D., and David A. Talan, M.D.,
for the EMERGENCY ID Net Study Group*

422 pacientes en 11 hospitales de USA

S. aureus en 320 pacientes

Prevalencia de SAMR

59% (15-74%)

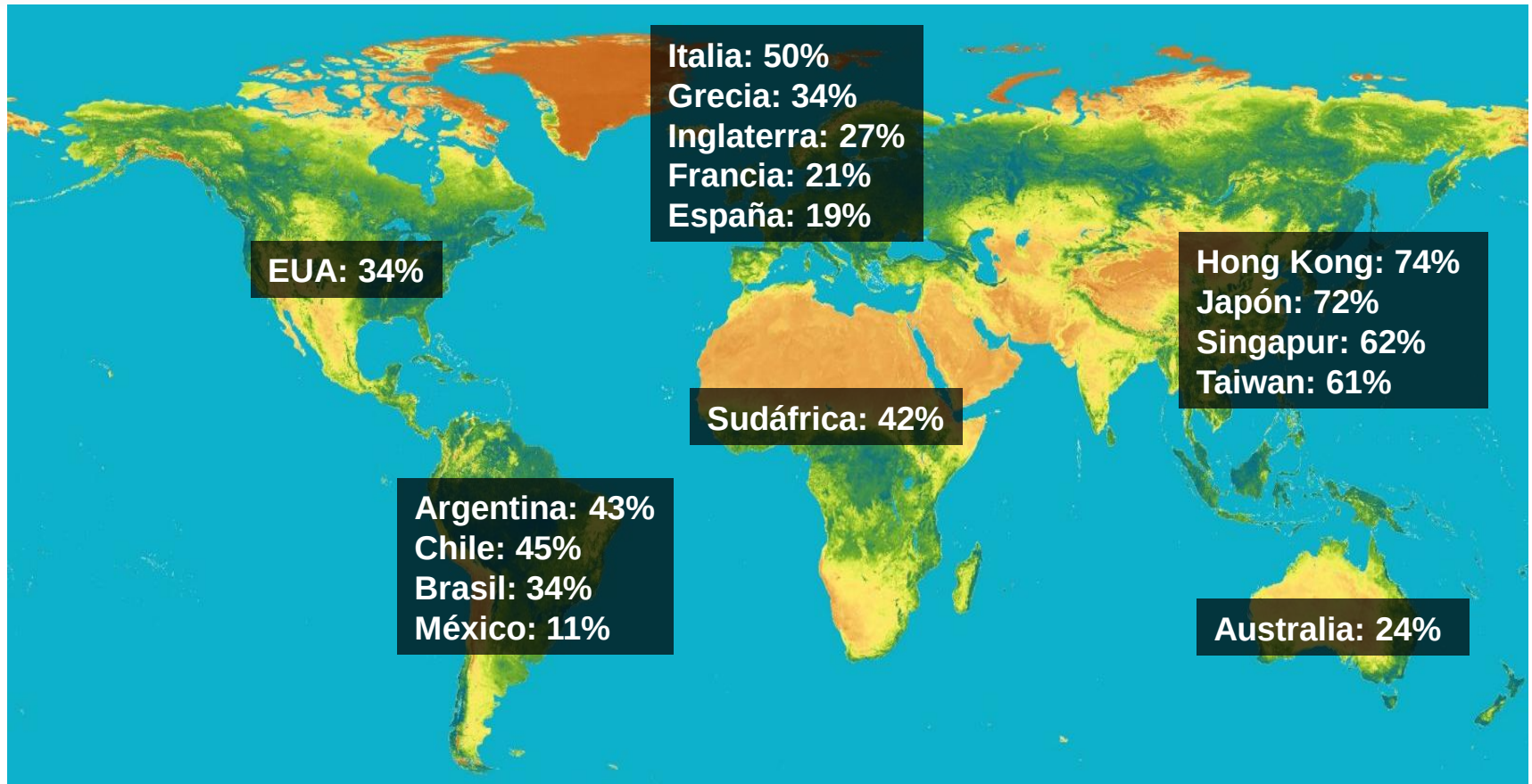
RESEARCH

Methicillin-resistant *Staphylococcus aureus* in the Australian community: an evolving epidemic

Graeme R Nimmo, Geoffrey W Coombs, Julie C Pearson, Francis G O'Brien, Keryn J Christiansen, John D Turnidge, Iain B Gosbell, Peter Collignon and Mary-Louise McLaws, on behalf of the Australian Group for Antimicrobial Resistance (AGAR)

MJA 2006; 184: 384–388

Creciente proporción de los aislados de bacteriemia por MRSA en el mundo entero



Clin Infect Dis. 2001;32:S114-32

SEXTO PASO

Asuma resistencia !!!
Conozca su epidemiología local

SEPTIMO PASO

***Cuales son las opciones terapéuticas para el
tratamiento del SAMR en infecciones
complicadas de piel y
tejidos blandos?***

TABLE 2

Antimicrobial Therapy for *Staphylococcus aureus* Infections

<i>Type of infection</i>	<i>Antibiotic choice</i>	<i>Alternate antibiotic choices</i>	<i>Length of therapy</i>
Simple, uncomplicated skin infections			Five to seven days
MSSA	Cephalexin (Keflex), dicloxacillin (Dynapen)	Clindamycin (Cleocin)	
MRSA	Clindamycin, trimethoprim/ sulfamethoxazole (Bactrim, Septra), linezolid (Zyvox)	—	
Complex skin and soft-tissue infections			Two to four weeks (varies)
MSSA	Nafcillin	Cefazolin (Ancef), clindamycin	
MRSA	Vancomycin (Vancocin)	Linezolid, daptomycin (Cubicin)	

Practice Guidelines for the Diagnosis and Management of Skin and Soft-Tissue Infections

Dennis L. Stevens,^{1,3} Alan L. Bisno,⁵ Henry F. Chambers,^{6,7} E. Dale Everett,¹³ Patchen Dellinger,² Ellie J. C. Goldstein,^{8,9} Sherwood L. Gorbach,¹⁴ Jan V. Hirschmann,^{3,4} Edward L. Kaplan,^{15,16} Jose G. Montoya,^{10,11,12} and James C. Wade¹⁷

Emerging antibiotic resistance among *Staphylococcus aureus* (methicillin resistance) and *Streptococcus pyogenes* (erythromycin resistance) are problematic, because both of these organisms are common causes of a variety of skin and soft-tissue infections and because empirical choices of antimicrobials must include agents with activity against resistant strains. Minor skin and soft-tis-

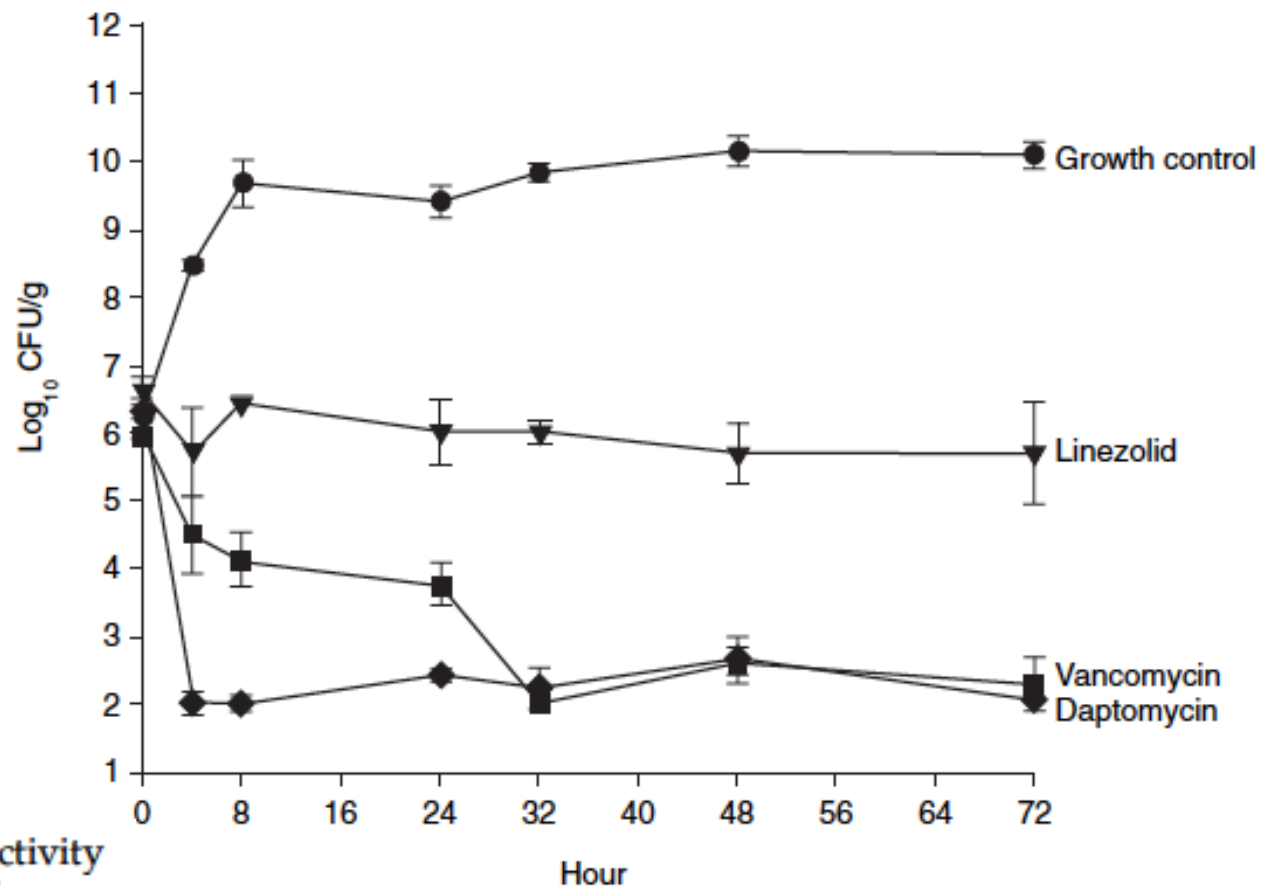


Fig. 1. In-vitro bactericidal activity of daptomycin, linezolid and vancomycin against a moderate inoculum of methicillin-resistant *Staphylococcus aureus* [36].

Glicopeptidos (Vancomicina)

Los Glicopéptidos han sido considerados como medicamentos de elección para infecciones por SARM.

- Limitaciones:

- Mala penetración tisular
- Potencial nefrotoxicidad
- Necesidad de administración parenteral
- Resistencia emergente a Vancomicina (VRSA)

1. Khare M, Keady D. *Expert Opin Pharmacother*. 2003;4:165-177.
2. Hiramatsu K. *Lancet Infect Dis*. 2001;1:147-155.
3. Pfeltz RF, et al. *Curr Drug Targets Infect Disord*. 2004;4:273-294.



MMWRTM

Morbidity and Mortality Weekly Report

Weekly

July 5, 2002 / Vol. 51 / No. 26

Staphylococcus aureus Resistant to Vancomycin — United States, 2002

Vancomycin-resistant staphylococci and enterococci: epidemiology and control

Fred C. Tenover and L. Clifford McDonald

The Role of Vancomycin in the Treatment Paradigm

Dennis L. Stevens

Infectious Disease Section, Veterans Affairs Medical Center, Boise, Idaho

Vancomycin was introduced in the United States in 1956 as a possible treatment for infections due to penicillin-resistant *Staphylococcus aureus*, but it was not used widely because of toxicity and the nearly simultaneous development of semisynthetic antibiotics and cephalosporins. Thus, its main indication was the treatment of serious gram-positive infections in penicillin-allergic patients. For susceptible strains of *S. aureus*, vancomycin was more rapidly bactericidal than penicillin, nafcillin, or cefazolin, and, in a rabbit model of *S. aureus* endocarditis, sterilization of vegetations was more rapid with vancomycin. In clinical practice, however, nafcillin remained the treatment of choice for staphylococcal bacteremia, largely because it had failure rates of only 4%. With the appearance of methicillin-resistant *S. aureus* and coagulase-negative staphylococci, vancomycin became the drug of choice for these infections. Recently, the efficacy of vancomycin has been questioned because of vancomycin's increasing minimum inhibitory concentrations among staphylococci, poor tissue penetration, and apparently slower bacterial killing than previously was recognized.

- **Eficacia de la vancomicina es cuestionada**
- **Pobre penetración tisular**
- **Menor efecto bactericida**
- **Cambios de la MIC**

The Safety and Efficacy of Daptomycin for the Treatment of Complicated Skin and Skin-Structure Infections

Robert D. Arbeit,^{1,a} Dennis Maki,² Francis P. Tally,¹ Edward Campanaro,¹ Barry I. Eisenstein,¹ and the Daptomycin 98-01 and 99-01 Investigators

¹Cubist Pharmaceuticals, Lexington, Massachusetts; and ²University of Wisconsin Medical School, Madison

skin and skin-structure infections. Among 902 clinically evaluable patients, clinical success rates were 83.4% and 84.2% for the daptomycin- and comparator-treated groups, respectively (95% confidence interval, -4.0 to 5.6). Among patients successfully treated with iv daptomycin, 63% required only 4–7 days of therapy, compared with 33% of comparator-treated patients ($P < .0001$). The frequency and distribution of adverse events were similar among both treatment groups. Overall, the safety and efficacy of daptomycin were comparable with conventional therapy.

The efficacy and safety of daptomycin vs. vancomycin for the treatment of cellulitis and erysipelas



P. E. Pertel,¹ B. I. Eisenstein,¹ A. S. Link,² B. Donfrid,³ E. J. A. Biermann,⁴ P. Bernardo,¹ W. J. Martone¹

Results: The clinical success rates were 94.0% for daptomycin and 90.2% for vancomycin (95% confidence interval for the difference, -6.7% , 14.3%). There were no statistically significant differences between treatment arms in the time to resolution or improvement in any of the predefined clinical end-points. Both daptomycin and vancomycin were well tolerated. **Conclusions:** There was no difference in the rate of resolution of cellulitis or erysipelas among patients treated with daptomycin or vancomycin. Daptomycin 4 mg/kg once daily appeared to be effective and safe for treating cellulitis or erysipelas.

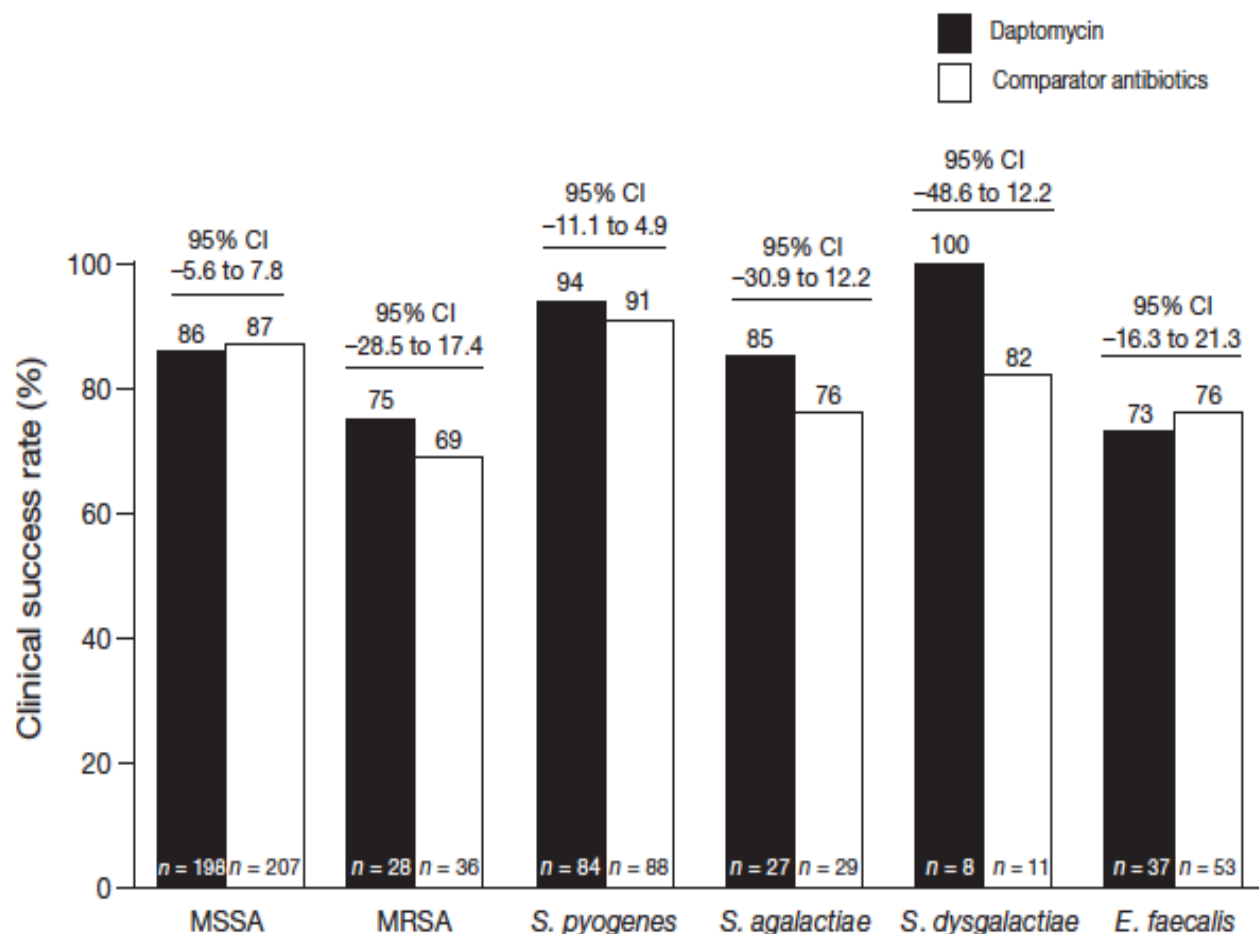


Figure 1. Clinical success rates in daptomycin phase III clinical trials in cSSTIs, by infecting Gram-positive organism⁴⁸. CI = confidence interval for the difference in success rates (the rate in the comparator group minus that for the daptomycin group); cSSTIs = complicated skin and soft tissue infections; MRSA = methicillin-resistant *S. aureus*; MSSA = methicillin-susceptible *S. aureus*

OCTAVO PASO

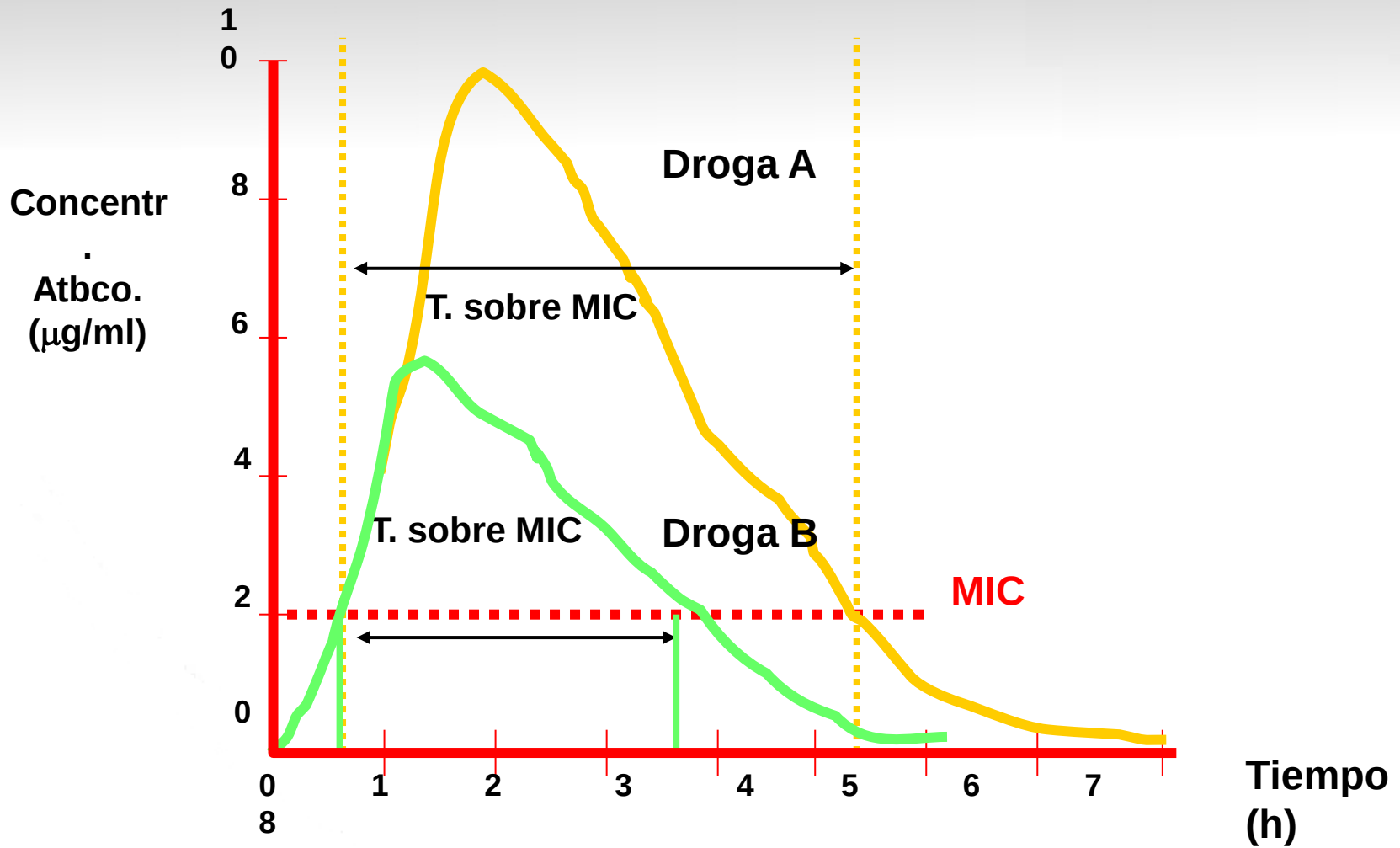
***Dosifique bien los
antibioticos...Conozca los efectos
colaterales***

Influence of Vancomycin Minimum Inhibitory Concentration on the Treatment of Methicillin-Resistant *Staphylococcus aureus* Bacteremia

Alex Soriano,¹ Francesc Marco,² José A. Martínez,¹ Elena Pisos,¹ Manel Almela,² Veselka P. Dimova,² Dolores Alamo,² Mar Ortega,¹ Josefina Lopez,¹ and Josep Mensa¹

Departments of ¹Infectious Diseases and ²Microbiology, Hospital Clinic of Barcelona, Barcelona, Spain

Conclusions. Mortality associated with MRSA bacteremia was significantly higher when the empirical antibiotic was inappropriate and when vancomycin was empirically used for treatment of infection with strains with a high vancomycin MIC ($>1 \mu\text{g/mL}$).



Is Toxicity Limiting the Ability to Optimize Vancomycin AUC/MIC?

Nephrotoxicity in patients treated for nosocomial MRSA infections, by vancomycin trough level

	Trough <15 µg/mL	Trough 15-20 µg/mL
Nephrotoxicity	0%	12%

Nephrotoxicity for patients receiving 14 days or more of vancomycin therapy, by trough level

	Trough ≤15 µg/mL	Trough >15 µg/mL
Nephrotoxicity	0%	15%

Nephrotoxicity for patients treated with vancomycin monotherapy for MRSA HCAP

	Trough <15 µg/mL	Trough ≥15 µg/mL
Nephrotoxicity	30.2%	58.8%

Hidayat LK et al. *Arch Int Med*. 2006;116:2138-2144.
 Lee-Such SC et al. 2006 ICAAC. Abstract L-1298.
 Jeffres MN et al. 2006 ICAAC. Abstract K789.

Please see full Prescribing Information available in this kit.

NOVENO PASO

***Terapia dirigida a la reanimación
temprana.***

No todo es el antibiotico...

N Engl J Med 2001;345:1359-1367

Early goal-directed therapy



NOVENO PASO

Early goal-directed therapy

Variable	Temprano N=130	Convencional N=133	<i>p</i>
Mortalidad 28 días	30.5%	46.5%	0.009

$$RA = 46.5\% - 30.5\% = 16\%$$

$$RR = 30.5/46.5 = 0.65$$

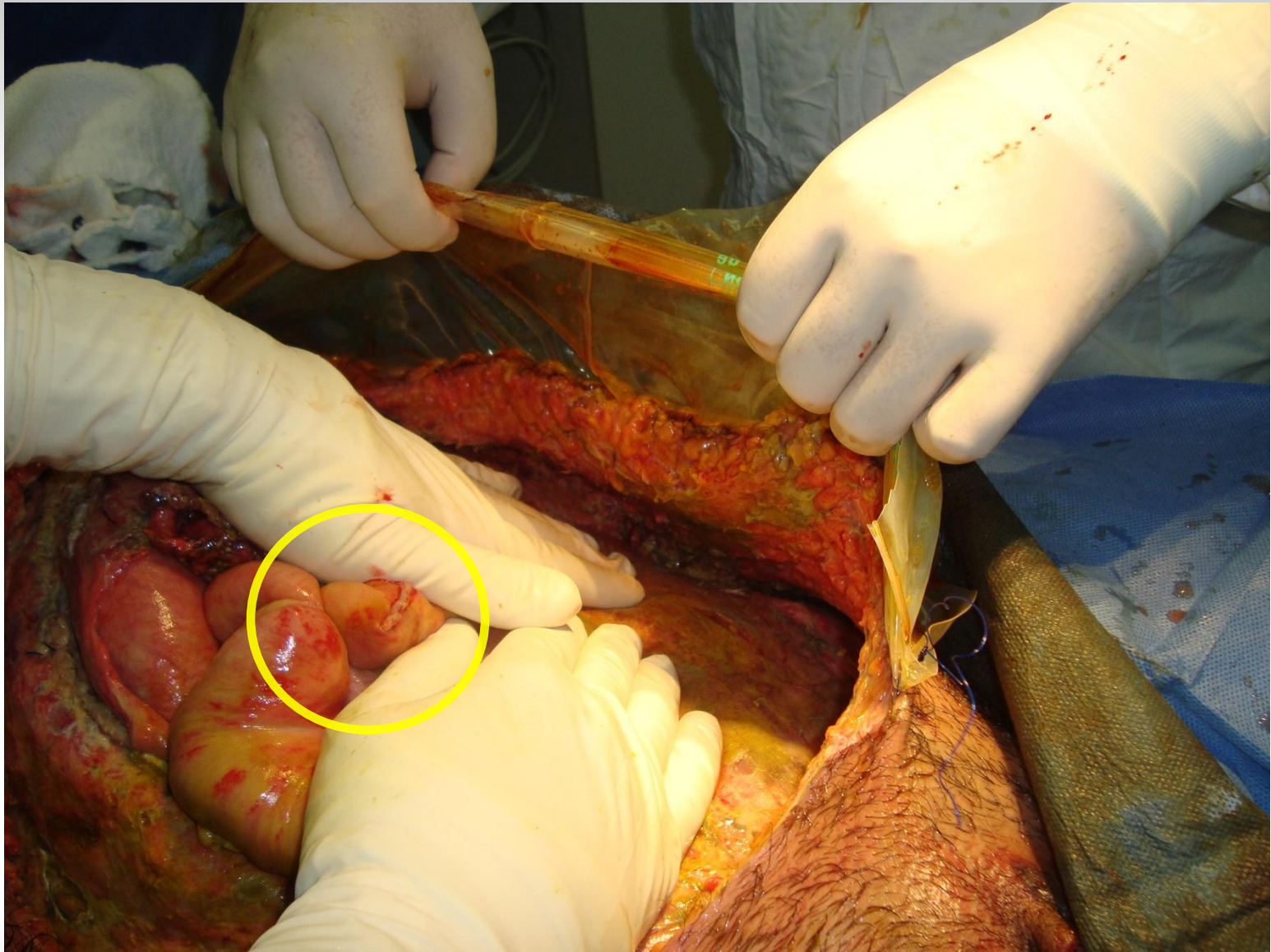
$$OR = 1.92$$

$$**NNT = 6.25**$$

N Engl J Med 2001;345:1359-1367

DECIMO PASO

Control del foco infeccioso





DECIMOPRIMER PASO

Evalúe la respuesta a los antibioticos

Interpretar el Antibiograma

Desescale !!!

DECIMOSEGUNDO PASO

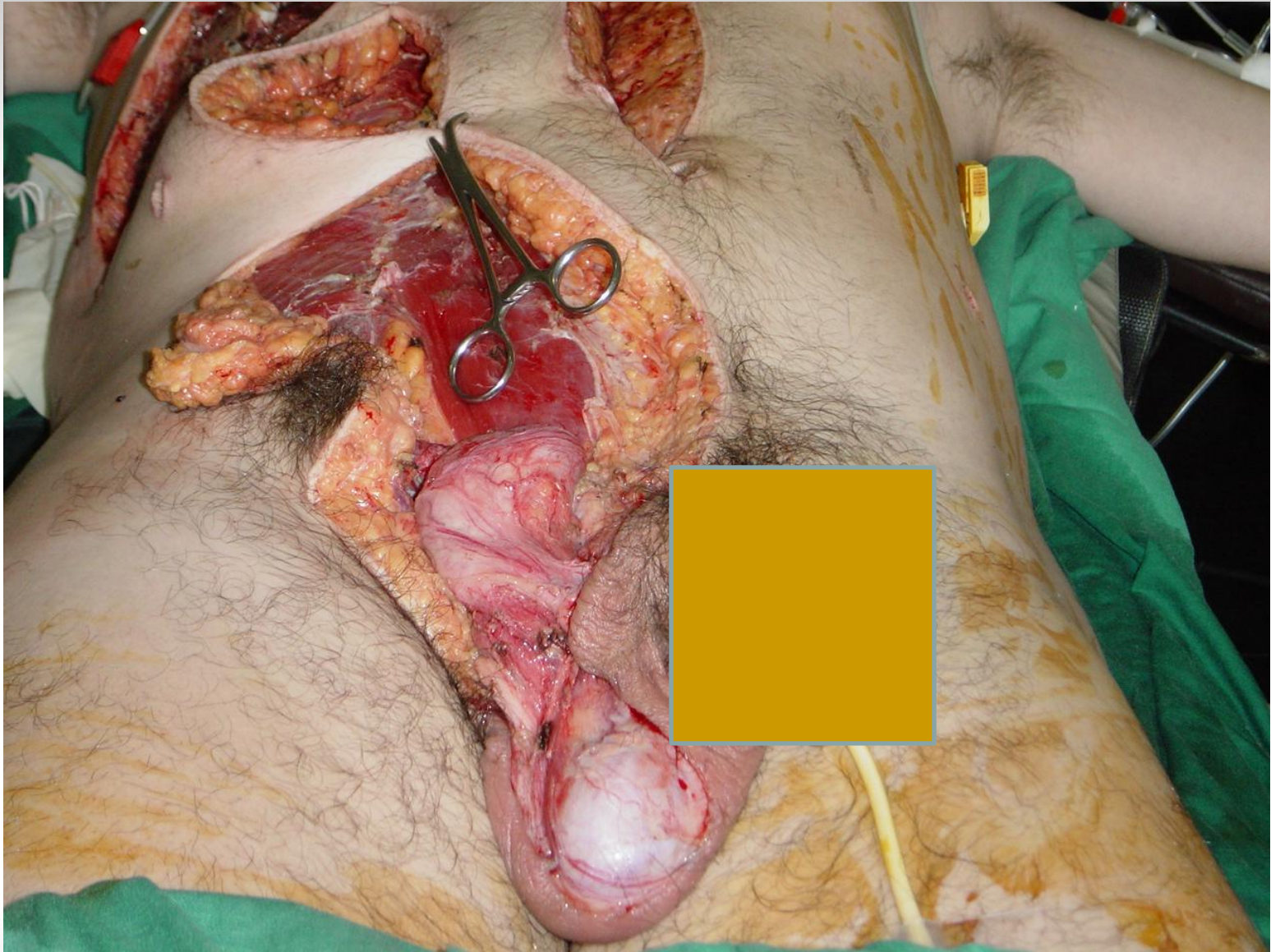
Interconsulte al experto !!!!!!!



DECIMOSEGUNDO PASO

Interconsulte al experto !!!!!!!









¡Gracias!

Nuestros reconocimientos



Certificado No. SC 1121-1



Certificado No. SC 1121-1



Certificado No. SC 1121-1



Premio
en Salud Colombia
Categoría plata 2006



Premio a la Calidad
Calidad de la
Gestión 2007



Accreditación No. 818
Fecha: 28 / 04 / 2006

Accreditación
en Salud



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